



Summary of Fishery Surveys Chelsea and Little Chelsea Lakes, Taylor County, 2015-2016

WDNR's Fisheries Management Team from Park Falls completed fyke netting and electrofishing surveys in 2015 and 2016 to assess the status of important fish populations in Chelsea Lake and Little Chelsea Lake. Fyke netting in October yielded useful information on black crappies. Fyke nets deployed again shortly after the 2016 spring thaw targeted northern pike, walleye, muskellunge, and yellow perch. A late-spring electrofishing survey documented the abundance and size structure of largemouth bass and bluegill populations. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. "Keeper size" is our own description applied to bluegill ≥ 7 inches long and black crappie ≥ 9 inches long, based on known angler behavior.

Survey Effort

On October 27–29, 2015 when water temperature was 48–50°F, we fished three fyke nets in each lake to intercept fall movements of black crappies, tending the nets once after two nights for 6 net-nights of fishing effort per lake. On April 14–18, 2016 at water temperature 42–55°F we again set three fyke nets per lake at locations chosen to intercept early-spring spawning species. Due to our obligations in higher-priority surveys, we tended our early spring fyke nets twice—initially after fishing them overnight for one night and finally after three consecutive nights for a total of 12 net-nights of effort per lake. Leatherleaf bog and cattail marsh surrounded most of both lakes, so sites were scarce where nets could be attached to solid shore. The steeply-sloped lakebed favored 50-foot, rather than 75-foot fyke net leads at most suitable netting locations. With water temperatures at 67°F our June 6, 2016 electrofishing survey should have coincided with the early spawning activities of largemouth bass and bluegills. We sampled the entire 2.59 miles of Chelsea Lake's shoreline that was accessible to our electrofishing gear in 1.25 hours, including 0.50 mile sub-sampled for all species in 0.28 hour. We dipnetted all fish species in our complete shoreline circuit on Little Chelsea Lake, covering 0.79 mile in 0.38 hour.

Habitat Characteristics

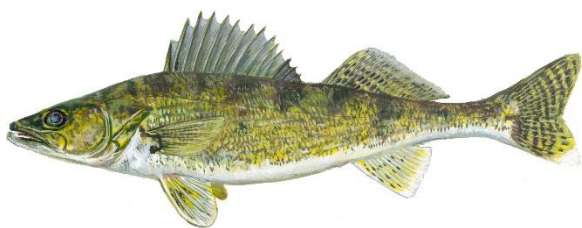
Chelsea and Little Chelsea lakes are soft water lakes located side by side, eleven miles north of Medford and just west of Chelsea, Wisconsin. Though both are listed as seepage lakes in *Wisconsin Lakes* (WDNR PUB-FH-800, 2009), the 1935 aerial photo shows the surface water connection between these lakes. A culvert beneath the town road maintains the hydrological connection, suggesting that Little Chelsea Lake is more appropriately a drained lake with an outlet, but no apparent inlet stream. The 1970 WDNR publication *Surface Water Resources of Taylor County* accurately describes Chelsea Lake as a drainage lake with an outlet to Fisher Creek where an 8-foot dike was built in 1961 to control water levels and "reduce the risk of winterkill"—fish mortality caused by dissolved oxygen depletion in ice-covered lakes.

Little Chelsea Lake has a surface area of 11 acres, maximum depth of 30 feet, average depth of 18 feet, clear water (Secchi depth = 7 feet), a near-shore lakebed comprised of muck (90%) and gravel (10%), and moderate aquatic plant density. In 60-acre Chelsea Lake maximum and mean depth are 23 and 13 feet. Bottom material is mainly muck with scattered areas of sand, gravel, and rubble near shore. Water clarity is moderate (Secchi depth = 4 feet). Based on their water clarity both lakes are classified as “mesotrophic,” having a mid-range rate of biological production. Even with moderately clear water, difficult electrofishing conditions in both lakes hampered our ability to see and capture fish. Much of their atypical perimeter had depth ≥ 6 feet, dense stands of lily pads, and large floating bogs beneath which many partially-stunned fish escaped before they were dip-netted. Chelsea Lake’s north end was completely covered by floating bog and inaccessible by boat. These factors that compromised our sampling efficiency provided excellent fish habitat—we noted many submerged trees, stumps, and sunken bogs throughout lake. The Taylor County Sportsmen’s Association placed 37 traditional log fish cribs along the southeast shore of Chelsea Lake in 2005. Both lakes have boat access from the town road that separates them, and Taylor County maintains a park with a boat landing, beach, pavilion, and shorefishing pier on the east shore.

Summary of Results

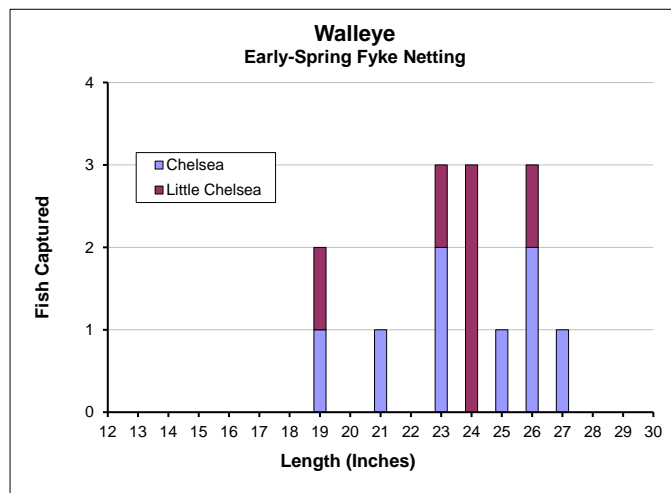
Surveys dating from 1965 show that the fish community is consistently comprised of largemouth bass, northern pike, bluegill, black crappie, pumpkinseeds, yellow perch, golden shiners, and yellow bullheads—the species one would expect to find in waters with Chelsea and Little Chelsea lakes’ habitat and water quality characteristics. Fyke netting and electrofishing in 2015–2016 captured eleven fish species, seven of which were found in both lakes. Golden shiners were recorded from Chelsea Lake in 2006, but not in these contemporary surveys. Bluegills and pumpkinseeds exhibited hybrid features. The last known fishery survey in Little Chelsea Lake was completed in 1965.

Walleye



Early Spring Fyke Nets

	Number per net-night ≥ 10 "	Quality Size ≥ 15 "	Preferred Size ≥ 20 "	Memorable Size ≥ 25 "
Chelsea	0.7	100%	88%	50%
Little Chelsea	0.5	100%	83%	17%
Combined	0.6	100%	86%	36%



The low capture rate of walleye in early spring fyke nets suggests that annual cooperative efforts to purchase or raise walleyes stocked into Chelsea Lake as 5- to 7-inch fingerlings in fall 2008–2016 have shown limited success in providing added predatory pressure to control panfish abundance and “bonus” fishing opportunity. Nonetheless, some of the 450 large fingerlings stocked on average per year (range 153–1020) survive and grow to advance those objectives. Walleye stocking is authorized in Chelsea Lake

only, but apparently some walleyes migrated (or were secretly planted) into Little Chelsea Lake. Anglers willing to invest enough time should be rewarded by a chance to fish a stocked walleye population with higher-than-average shares of preferred- and memorable-size fish ≥ 20 and 25 inches long.

Muskellunge



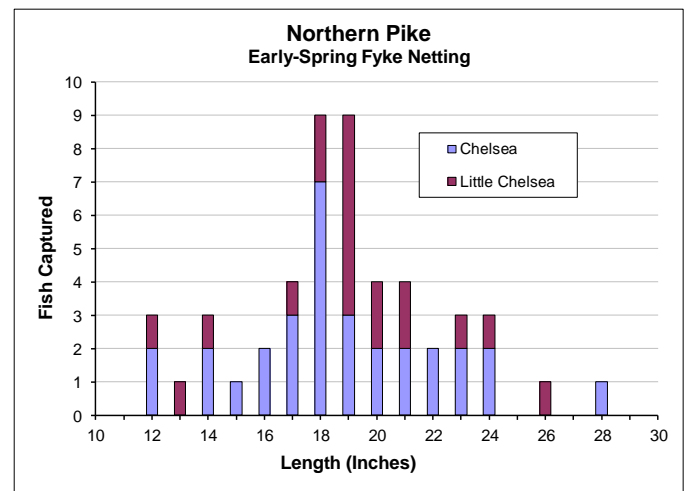
The 41.9-inch female muskellunge captured in our early spring 2016 fyke nets was similar in size to the 42-inch, 17½-pound musky that an angler caught, photographed, and released in Chelsea Lake 2⅔ years earlier on August 17, 2013. Until then, we had no record of adult muskellunge captured in surveys or by angling in these lakes. In the fish stocking history for Chelsea Lake was a single record of 20,375 muskellunge stocked as fry in 1937. Though possible, it is unlikely that these adult muskellunge are descendants of the fry planted 79 years earlier. It is doubtful that any number of musky fry stocked so long ago into a fish community with largemouth bass and northern pike as the dominant predators could survive and sustain a low density musky population for many generations. Musky do occur downstream from Chelsea Lake in the South Fork Jump River, and they may at times use portions of its tributary streams, including Silver Creek and Fisher Creek. However, the 7-foot hydraulic height of the dam on Fisher Creek, which impounds Chelsea Lake, would prevent upstream movement of fish through the narrow, vertical outlet structure, even in the highest flow conditions. We suspect that unauthorized stocking would be the most probable explanation for muskellunge in Chelsea Lake. We believe these records represent several (or possibly one) individual fish, and not a population.

Northern Pike



Early Spring Fyke Nets

	Number per net-night ≥ 14 "	Quality Size ≥ 21 "	Preferred Size ≥ 28 "
Chelsea	2.4	31%	3%
Little Chelsea	1.4	29%	0%
Combined	1.9	30%	2%



Northern pike captured at a moderately low rate in early spring fyke nets depict an adult population with low abundance and a surprisingly low proportion (only 4%) of fish longer than 24 inches. We did not collect bony structures to compare pike length at various ages with regional averages. However, based on annular counts on scales taken from seven pike in May and August 1974, growth of pike was found to be excellent, compared to a similar measure in eight northern Wisconsin lakes. In the same 1976

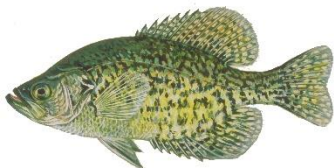
report the author states that Chelsea Lake is producing some of the largest northern pike in his area of fishery management responsibility. Other records describe “heavy” fishing pressure on Chelsea Lake, including an annual icefishing contest that attracted an estimated 200 participants in February 1984. If pike growth rate remains satisfactory, as expected at low population abundance, then anglers may be selectively harvesting the largest pike faster than the population can produce replacements in a small lake near a city, even if fishing pressure subsided somewhat over the last 30 years.

Yellow Perch



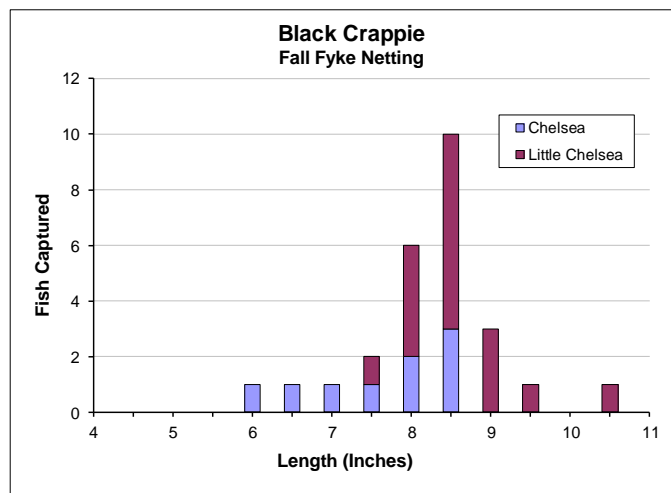
Consistent with past survey results, yellow perch were present in very low abundance. Our combined netting and electrofishing effort in 2015–2016 captured only six perch in Chelsea Lake and none in Little Chelsea Lake. The longest was 8 inches.

Black Crappie



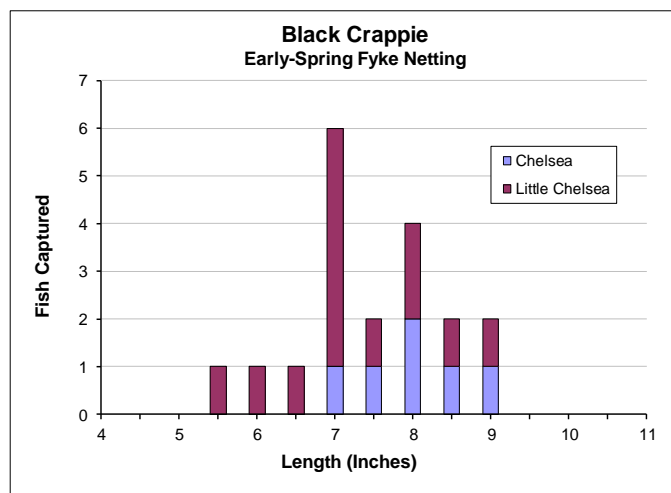
Fall Fyke Nets

	Number per net-night $\geq 5''$	Quality Size $\geq 8''$	Preferred Size $\geq 10''$
Chelsea	1.5	56%	0%
Little Chelsea	2.8	94%	6%
Combined	2.2	81%	4%



Early Spring Fyke Nets

	Number per net-night $\geq 5''$	Quality Size $\geq 8''$	Preferred Size $\geq 10''$
Chelsea	2.2	67%	0%
Little Chelsea	3.1	31%	0%
Combined	2.6	42%	0%



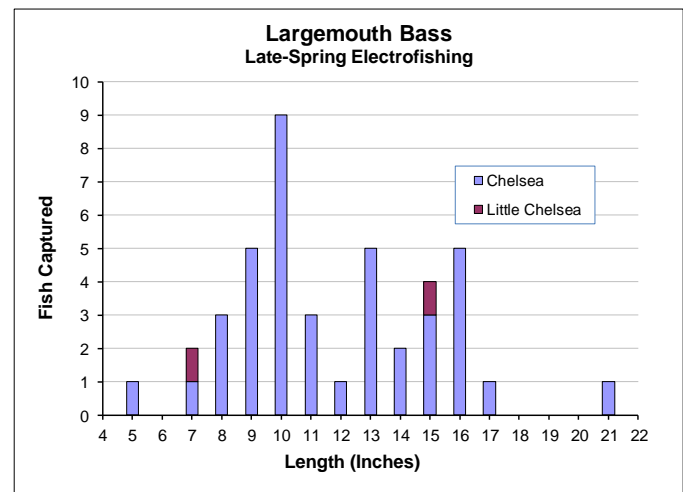
Similar catch rates of black crappie in fall and early spring fyke nets indicated low population abundance in both lakes. Our spring 2016 electrofishing catch rates of 4 and 0 crappies per mile in Chelsea and Little Chelsea lakes also portrayed low abundance. Only one crappie captured by each gear was longer than 10 inches. A local angler, who watched us empty our fall nets, felt that crappie size and abundance were higher than our recent surveys suggested, based on his and others' catch in the previous winter.

Largemouth Bass



Late Spring Electrofishing

	Number per mile $\geq 8''$	Number per hour $\geq 8''$	Quality Size $\geq 12''$	Legal Size $\geq 14''$	Preferred Size $\geq 15''$
Chelsea	15	30	47%	32%	26%
Little Chelsea	1.3	2.6	100%	100%	100%
Combined	12	24	49%	33%	28%



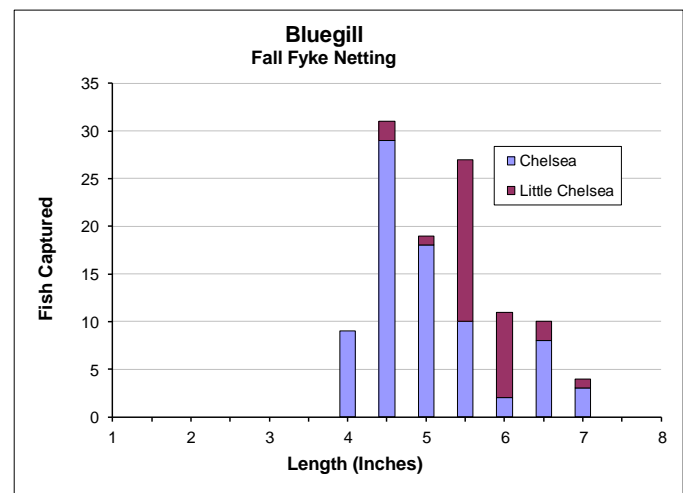
We characterized largemouth bass population abundance as low to moderate in Chelsea Lake and low in Little Chelsea Lake, based on our late spring electrofishing capture rates, which we subjectively adjusted to account for fish seen, but not captured. Our sample from Chelsea Lake represented a wide range of size and age classes. A third of the bass captured were legal size fish ≥ 14 inches. One memorable-size fish 21.3 inches long ranked fifth among 11,613 largemouth bass measured in Price, Rusk, and Taylor counties in surveys from 1946 to 2016. Scale analysis revealed that largemouth bass length at ages 1–5 was “average or better” in 1974. In moderate abundance the population’s growth rate is probably still satisfactory.

Bluegill



Fall Fyke Nets

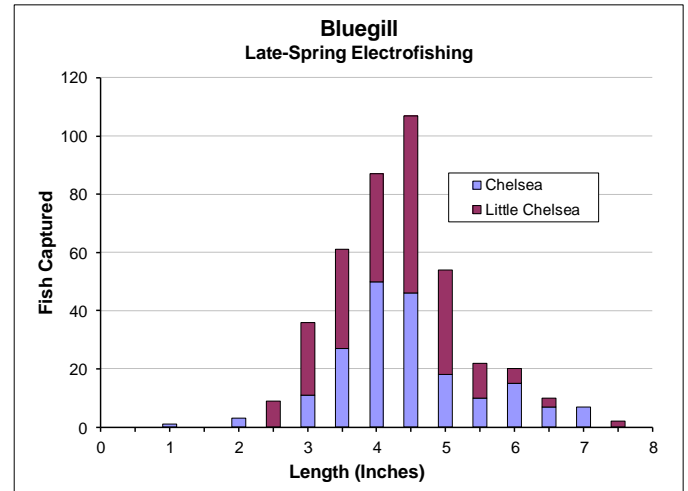
	Number per net-night $\geq 3''$	Quality Size $\geq 6''$	Keeper Size $\geq 7''$
Chelsea	13	16%	4%
Little Chelsea	5.3	38%	3%
Combined	9.3	23%	4%





Late Spring Electrofishing

	Number per mile $\geq 3''$	Number per hour $\geq 3''$	Quality Size $\geq 6''$	Keeper Size $\geq 7''$
Chelsea	382	682	15%	4%
Little Chelsea	272	566	5%	0.9%
Combined	315	615	10%	2%



All our measures clearly point toward a bluegill population whose excessive abundance results in food competition, impaired growth, and unsatisfactory length distribution. In our combined electrofishing samples we captured over 600 bluegills per hour—a rate we correlate with very high population abundance. Fall fyke nets captured higher proportions of quality-size bluegills ≥ 6 inches compared to netting (10% in Chelsea and 0% in Little Chelsea) and electrofishing in spring, but the share of keeper-size bluegills at least 7 inches long was 4% or less in all samples. Preferred-size bluegills were absent. Past and current bluegill population status, surely disappointing to most anglers, stems from ineffective predatory control of bluegill recruitment by largemouth bass and northern pike, which share dominance in the fish community. Stocking large walleye fingerlings to supplement predation pressure on panfish populations has not produced the desired improvement in bluegill size structure since 2008 when we initiated that strategy.

Yellow Bullheads

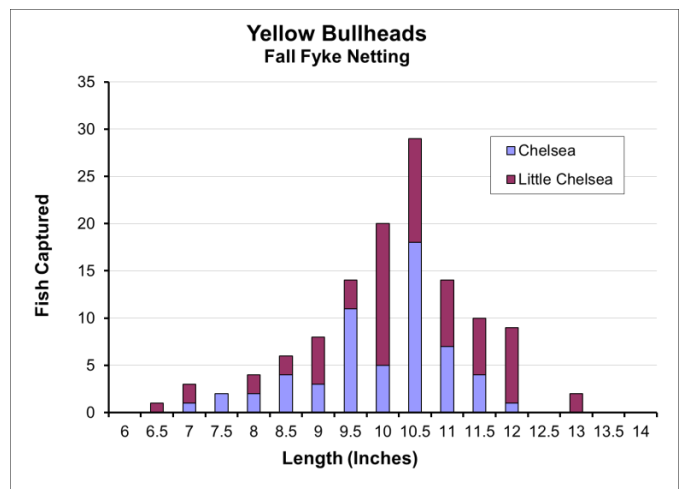


Fall Fyke Nets

	Number per net-night $\geq 4''$	Quality Size $\geq 7''$	Preferred Size $\geq 9''$	Memorable Size $\geq 11''$
Chelsea	9.7	100%	84%	21%
Little Chelsea	11	98%	89%	36%
Combined	10	99%	87%	29%

Early Spring Fyke Nets

	Number per net-night $\geq 4''$	Quality Size $\geq 7''$	Preferred Size $\geq 9''$	Memorable Size $\geq 11''$
Chelsea	21	97%	68%	21%
Little Chelsea	5.6	100%	82%	24%
Combined	13	98%	73%	22%



Those who enjoy catching or eating bullheads can find angling opportunity in Chelsea and Little Chelsea lakes. Our spring and fall fyke net catches in both lakes included high proportions of preferred- and memorable-size yellow bullheads, but netting catch rates were ambiguous as a measure of population abundance. Fall nets captured yellow bullheads at similar rates in Chelsea and Little Chelsea lakes. However, our netting capture rate of bullheads in early spring was more than twice the fall rate in Chelsea Lake compared to nearly half the fall rate in Little Chelsea Lake. We caught no bullheads by electrofishing.

Survey data collected and analyzed by: Matt Anchor, Evan Sniadajewski, and Jeff Scheirer—WDNR Fishery Team, Park Falls.

Written by: Jeff Scheirer—Fishery Biologist, December 22, 2016.

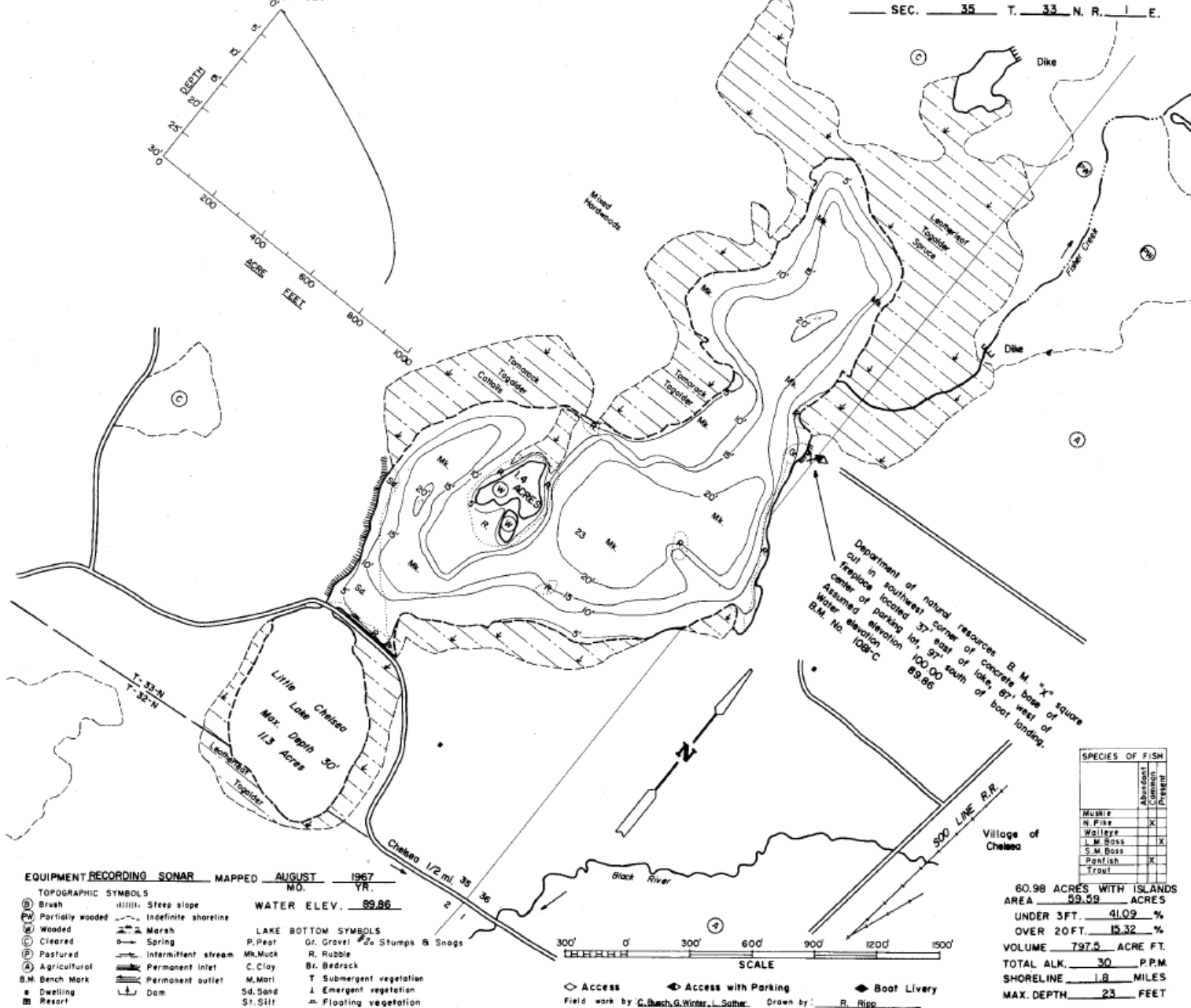
Reviewed by: Steve Gilbert—Woodruff Field Unit Supervisor, January 25, 2018.

Approved for web posting by: Mike Vogelsang—Northern Administrative District Supervisor, January 29, 2018.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

LAKE SURVEY MAP

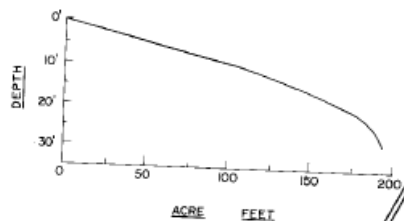
CHELSEA LAKE
TAYLOR COUNTY
SEC. 35 T. 33 N. R. 1 E.



LAKE SURVEY MAP

LITTLE CHELSEA LAKE
TAYLOR COUNTY
SEC. 35 T. 33 N. R. 1 E.

Chelsea Lake
59.6 Acres
Max. depth 23'



Department of Natural Resources B.M. "X" No. 1081-C on northeast side of Chelsea Lake by Public access.
Assumed elevation 100.00
Water elevation 89.86

EQUIPMENT RECORDING SONAR MAPPED AUGUST 1967
MO. YR.

TOPOGRAPHIC SYMBOLS

- (B) Brush
- (PW) Partially wooded
- (W) Wooded
- (C) Cleared
- (P) Pastured
- (A) Agricultural
- B.M. Bench Mark
- Dwelling
- Resort

WATER ELEV. 89.86

LAKE BOTTOM SYMBOLS

- P. Peat
- Mk. Muck
- C. Clay
- M. Marl
- Sd. Sand
- St. Silt
- Gr. Gravel
- R. Rubble
- Br. Bedrock
- T. Submergent vegetation
- E. Emergent vegetation
- F. Floating vegetation
- S. Stumps & Snags



Access Access with Parking Boat Livery
Field work by: G. Busch, G. Winter, L. Sather, Drawn by: R. Ripp

SPECIES OF FISH		
	Abundant	Present
Muskie		
N. Pike	X	
Walleye		
L. W. Bass	X	
S. W. Bass		
Panfish	X	
Trout		

AREA 11.27 ACRES
UNDER 3 FT. 55.63 %
OVER 20 FT. 50.22 %
VOLUME 194.5 ACRE FT.
TOTAL ALK. 30 P.P.M.
SHORELINE .5 MILES
MAX. DEPTH 30 FEET